Nicotine Pouches and Oral Health

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Conflict of Interest Disclosure Statement

- Ms. Pondolfino reports no conflicts of interest associated with this course. She has no relevant financial relationships to disclose.

Short Description – Forensic Dentistry

This free dental continuing education course reviews oral nicotine pouches (ONPs) features, Federal Drug Administration regulations, nicotine correlation to brain development, and nicotine replacement therapy while highlighting the oral health care professionals role in addressing the new trend of ONPs usage in youth and young adults.

Overview

This course prepares oral health care professionals to review current scientific evidence-based literature on how oral nicotine pouches impact oral health, oral disease and systemic health, to ensure this information is effectively communicated and disseminated to patients through patient education. This course reviews oral nicotine pouches (ONPs) features, Federal Drug Administration regulations, nicotine correlation to brain development, and nicotine replacement therapy. The course reviews dental caries, oral mucosa, periodontal conditions/alveolar bone destruction, stain, gastrointestinal, risk of cancer in correlation to ONPs usages. Finally, the course highlights the oral health care provider's professional role in addressing this new public health trend of ONPs usage in our youth and young adults.

As nicotine products become increasingly prevalent among adolescents and young adults globally, oral health care professionals must be prepared to address these emerging current health trends. Oral nicotine pouches are deemed a rising detrimental public health concern, promoting dual tobacco usage within our youth. ONPs are heavily promoted on social media, intentionally targeting younger audiences and capturing significant interest. Social media, advertising and marketing trends that promote oral nicotine pouches (ONPs) as a safer alternative, than other nicotine products appear favorable to youth, which could mislead younger adults to develop dual nicotine dependency, in conjunction with e-cigarettes.

Dental professionals can collaborate with public health workers, pediatricians, educators, and smoking cessation specialists to create educational programs aimed at preventing the use of nicotine pouches and other products among adolescents. They have an ethical obligation to reach vulnerable populations by informing patients of current trends that impact their overall health.

Course Contents

Learning Objectives

Upon completion of this course, the dental professional should be able to:

- Understand the composition and usage of oral nicotine pouches (ONPs) including different brands and features.
- Analyze the impact of ONPs on oral health including their impact on dental caries, oral mucosa, periodontal conditions and the risk of cancer.
- Evaluate the role of oral health professionals, understanding ethical obligations and the professional role in patient education, health history assessment and collaboration with other health providers.
- Examine regulatory and marketing strategies surrounding ONPs.
- Assess the impact of nicotine on adolescent brain development including potential for addiction and long-term cognitive and behavioral consequences.
- Discuss nicotine replacement therapy and smoking cessation.
- Identify strategies for prevention and education, including educational programs and collaboration..

Introduction

As nicotine products become increasingly popular among adolescents and young adults globally, oral health care professionals must be prepared to address these emerging trends. Oral nicotine pouches (ONPs), are deemed a rising detrimental public health concern, promoting dual tobacco

usage within our youth.[1] Tobacco products such as smokeless tobacco, cigarettes, and e-cigarettes have well-documented effects on oral health.[2] However, currently the use of oral nicotine pouches is on the rise and new brands are continuously emerging. These products are heavily promoted on social media, intentionally targeting younger audiences and capturing significant interest.[3] Oral health professionals must stay informed by reviewing current scientific evidence-based literature on how oral nicotine pouches impact oral health and oral disease, ensuring this information is effectively communicated and disseminate this information to patients through education.

What Are Oral Nicotine Pouches

Oral nicotine pouches were introduced in the United States in 2016, with the intention to move the population away from conventional cigarettes but instead created a global epidemic among young adults. Oral nicotine pouches have dramatically increased recent appeal to young adults due to constant promotion with advertisements, convenience, and accessibility, with a wide variety of brand selections available in many flavors.[4] Oral nicotine pouches are prepared in discrete, dissolvable, prefilled pouches with penetrating properties, consisting roughly of 80-90% water, cellulose, along with crystalized nicotine powder or plant-based fibers.[5] Nicotine in ONPs is either tobacco-derived nicotine (TDN), extracted from tobacco leaves and converted into nicotine salts, or chemically synthesized (SyN). Chemically synthesized oral nicotine pouches are a combination of nicotine and other constituents, which are produced by a chemical process instead of directly derived from an actual tobacco plant.[1] Oral nicotine pouches have been inaccurately marketed as a less harmful alternative to nicotine products, allegedly because lack of combustion involvement and the absence of the direct tobacco leaves in the product, with limited data confirming this.[1] One container for purchase, holds approximately 20 nicotine pouches, clearly labeled "addictive chemical" product containing nicotine due to legal regulations in the United States.[5]

However, nicotine pouches are not currently regulated in the European Union (EU), but within the member states. European member states are cracking down on sales to minors, with increased taxes on the products. Each pouch is limited to 10-17 milligrams of nicotine. The labels must include increased health warnings, and only tobacco, mint, or menthol flavors are allowed. While some countries are waiting for guidance for the European Commission, other countries such as France, Austria, Belgium, Germany and the Netherlands have already implemented a ban for the sale of the products.[6]

Placed in the oral cavity on the labial mucosa, adjacent to gingiva, nicotine is released and absorbed in the blood stream. The time frame and amount of grams per pouch directs how quickly the nicotine is delivered. While some stronger products reach 17 mg per pouch, the average nicotine content typically ranges from 1.29 to 6.11mg per pouch.[5] Nicotine in pouches are absorbed from the lining of the mouth with a steady intake, whereas nicotine in cigarettes is absorbed more rapidly through the lungs.[7] A standard cigarette contains about 10-13mg of nicotine but approximately 1-2mg of nicotine is absorbed, due to inefficiencies with combustion delivery with inhalation. The level of milligrams in the ONPs must be reviewed when comparing nicotine absorption between a cigarette and an oral nicotine pouch. A higher milligram pouch could present more nicotine intake and the patient's metabolism will also affect the rate of nicotine absorption.[7,8]

Brands and Features

There are approximately eleven popular brands of oral nicotine pouches currently on the market. Some of these companies originated from Sweden and Scandinavian heritage, with increased attention now in the United States.[9] Each brand offers at least two or three options for nicotine strength with varying milligram (mg) levels, a range of sizes, dry or semi-dry pouch textures, and two to ten flavors for consumers to choose from. Consumers appreciate this variety for improved taste, comfort and discretion. One brand cleverly appeals to consumers with a gum-based formula, which has a softer application for consumption.[9] Oral nicotine pouches are also marketed as "fruit filled" with deliverables of breakers and slim. Breakers have gained popularity, offering capsule filled liquids within the nicotine pouch. Slims are preferred due to a desirable slender ergonomic design, that permits comfortable and discrete placement of the pouch, eliminating any bulge appearance under the lip.[9]

ONPs and FDA Regulations

The Federal Drug Administration (FDA) does regulate oral nicotine pouches, under the Tobacco Control Act. Any product that contains nicotine, including synthetic nicotine must follow laws and regulations under the ACT, regardless of if they are advertised as "tobacco-free". The Tobacco Control Act governs sale restrictions to youth, requires product warning labels, lists potential risks linked to usage backed by scientific-based evidence, ensures all product ingredients are clearly disclosed and grants the state, local and tribal delegated authority with rules and regulations for the sale of oral nicotine pouches.[10]

The FDA implemented a program in 2020 to help authorities prevent the misuse of tobacco products by youth and young adults. With the rise of enticing, flavored products, these new guidelines required all flavored tobacco products to be subjected to a detailed, science- based

Table 1. Brands and Features of common ONP's

ONP BRAND	Pouch Descriptions	Number of Flavors Available	Options for Pouch Strength
ZYN	Tobacco-free dry pouch	10	3mg and 6mg
ON!	Tobacco-free dry pouch	7	2mg, 4mg, and 8mg
Rogue	Tobacco-free dry pouch available in a larger sized pouch	10	3mg and 6mg
Velo	Tobacco-free dry pouch available in a mini sized pouch Slims	10	4mg, 7mg, 6mg, 9mg
Juice Head	Tobacco-free Fruit-forward pouch Synthetic nicotine	5	6mg and 12mg
Fre	Tobacco-free Semi-dry pouch	4	9mg, 12mg, and 15mg
Sesh	Tobacco-free Gum-based formula	3	4mg, 6mg, 8mg
ALP	Tobacco – free Synthetic nicotine	5	3mg, 6mg, and 9mg
Lucy	Tobacco-free (2) forms breakers and slims Flavored filled liquid in a capsule	6	4mg, 8mg, and 12mg
Zone	Tobacco-free Synthetic nicotine	7	6mg and 12mg
Grizzly	Tobacco-free Synthetic nicotine	4	7mg, 9mg, 12mg, 15mg

review to meet statutory FDA standards of protocol.[11] Currently the FDA has not granted approval of any kind of nicotine pouch to assist as a smoking cessation method due to limited research.[12]

ONPs Availability and Awareness

FDA guidelines and regulations require age verification to purchase nicotine pouches by providing identification, but young adults and adolescents can still circumnavigate these requirements. For example, ONPs can be purchased online with loose restrictions. A customer is asked if they are over the age of 21 and can simply click "yes" to access products. Purchases, however, may still require age verification with a validated date of birth, or need to be picked up in person, depending on local regulations.

The younger population is highly influenced and targeted on social media outlets, through deceptive "tobacco free" advertising and flavoring emphasis. Oral nicotine pouches are then wrongly perceived as a safer option for active smokers, or a possible resource to assist them in cessation, deflecting the addictive nature of the pouch. They are instead used in school or work setting among young adults to receive a "buzz" upon usage in social environments. Insufficient or lack of fully developed cognitive control in adolescents makes them more vulnerable to social pressure.[13,14] Social aspects with peer hang outs or social activities affecting stressors of mental health increasing depression, stress, anxiety and impulsive behavior in young adults,[15] can also lead to peer pressure to gain social acceptance to fit in by experimenting with ONPs. This can ultimately lead to potential nicotine dependency at a young age.[16]

A study in 2021, revealed that 37.3% of US young adults were aware of nicotine pouches, 29.2% were susceptible to usage, and 3.8% used them at least one time. In 2021, low prevalence was indicated, but there was a rise in awareness.[16] Current studies conducted in 2024, collected data with exposure to nicotine pouch marketing and correlation to nicotine usage, indicating awareness through oral nicotine pouch marketing, was on the rise and associated with higher odds of usage. Research concluded that 45.2% had knowledge of ONPs, and 17.4% never experimented with ONPs. The highest amount of awareness was reported through stores with 16.6%. Internet and social media ads were at 9.2%, relatives and friend's social media was 8.2%, direct mail had a percentage of 7.6% and finally printed ads from the media was at 6.9%.[17] Social media influencers are assisting the popularity of ONPs due to promoting and encouraging product usage on their channels as well. Young adults are subjected to multiple internet discussion boards and posts on social media platforms that are layered with misleading information. This leads to confusion, enables false acceptance and normalizes usage of oral nicotine pouches.[17,18]

Nicotine Impact on Adolescent Brain Development

Studies have also concluded that during adolescent years of development, the prefrontal cortex (PFC), which controls attention and behavior, has yet to fully mature.[13] Nicotine introduced during early brain development can stimulate a gateway for potentially addictive habits. Acetylcholine and glutamate signaling receptors, that assist with nerve cell communication from the prefrontal cortex are altered during nicotine usage in adolescence. Acetylcholine receptors assist with attention and muscle contraction, whereas glutamate receptors are the primary excitatory neurotransmitter assisting with learning and memory.[13] Nicotine can increase attention deficits behaviors impacting, learning, ability to focus, mood stability, impulse and inhibitory control. Exposure to nicotine products at a young age elevates the risk of addiction due to the sensitivity of the brain, by presenting molecular changes that alter functional synapses in the prefrontal cortex, impacting permanent cognitive brain capacity and memory.[14] Studies also indicated the prefrontal cortex nicotine response affects gene expression and neuronal morphology involvement including vesicle release, transcription, cytoskeleton dynamics, and signal transduction. All of which impact long-term adaptations with impaired structural and functional abilities and poorer cognitive performance. Psychiatric disorders have also been linked to nicotine usage later in life, when introduced at adolescent developmental stages.[13,14]

Nicotine Replacement Therapy and Smoking Cessation for Patients

There is limited current literature and research available to classify ONPs, as nicotine replacement therapy (NRT), or to suggest them as an option for smoking cessation during patient care. The FDA has not approved ONPs as a method for smoking cessation at this time due to lack of clinical evidence.[12] Compared to lozenges, the concentration of nicotine delivery was similar, while concentration was greater than that in nicotine gum.[5] Oral nicotine pouches can be considered to have addictive attributes, leading young adults to continue to advance to more severe habitual levels of smoking addictions, due longer periods of usage. Oral nicotine pouches can also present as a gateway for other more addictive behaviors and habits as well. The potential of addiction is boldly labeled on all packaging for ONPs purchase.[3] Currently, more research is needed regarding NRT and long-term addictive patterns regarding ONPs.[19]

Oral health care providers must still prepare and supply tobacco/nicotine cessation treatment for their patients, as an ethical obligation of duty and responsibility of standard care. Several countries and organizations such as the World Health Organization have adopted the 5A's approach, Ask, Advise, Assess, Act and Assist as a guide to cessation for clinicians.[20] The 5A's approach is suggested to be implemented in patient treatment, for oral professionals caring for patients, that are actively using tobacco and nicotine products.[21]

Dental Caries

Oral nicotine pouches contain additives and flavorings made of artificial sweeteners. More clinical research is needed to better appreciate the impact of ONP related sweeteners on caries risk rate. Compared to natural sucrose, artificial sweeteners have shown to reduce dental caries.[5,22] However, if used in conjunction with e-cigarettes, as a dual source of nicotine, the risk of dental caries increases. Synthetic flavors in e-cigarettes disrupt the microbe in biofilm and create an environment for *S. mutans* to flourish.[23] Caries risk assessment tools, such as CAMBRA, should be implemented as a standard procedure of care, determining if a patient is more susceptible to caries, allowing the clinician to treatment plan accordingly.[24]

Oral Mucosa

Recent studies indicated alterations in the oral mucosa occurred at the placement of the ONP, as well as the sulcus of the site. Oral mucosal tissues become granular, corrugated, and/or hyperkeratotic with leather like appearances, associated with circular or linear white or yellowish lesions in the presence of ONPs.[25] Keratinized tissues could lead to oral squamous cell carcinoma, when combined with risk factors such as nicotine and tobacco.[26] Unlike oral lesions associated with smoking, these oral lesions are localized mostly in the sulcus or vestibule and are considered less severe, resolving at an increased pace, after relocation of ONP placement.[27] It is imperative to continuously change the placement of the oral nicotine pouch in the oral cavity to minimize caries, pathology and recession.

However, its direct contact on gingival tissues can initiate irritation and lead to mechanical injury, increasing the occurrence of periodontal disease, along with localized gingival recession.[5] Microbes in the oral cavity are susceptible and at risk for oral soft tissue lesions from penetration of toxic chemicals presented in nicotine flavoring, such as menthol.[1] Additional findings include, gingival blisters, jaw sensations, soreness, and xerostomia.[26] Further continued research is needed to investigate oral pathology involvement, and although it is considered a lower risk, with lesions healing faster than traditional tobacco products because non-combustible agents, more evidenced based research is needed for further analysis.[26]

Periodontal Conditions & Alveolar Bone Destruction

Clinical Studies have reported adverse toxic reactions in the epithelial cells in conjunction with extracts in ONPs, affecting gingival attachment loss and gingival recession. Disruption of the oral microenvironment, triggers an inflammatory response, leading to increased periodontal destruction.[1] Recent studies revealed when exposed to nicotine, the nicotinic acetylcholine receptors (nAChR) are activated, which in turn suppresses the periodontal ligament (PDL) fibroblast cells, and compromises the integrity of stem cells.[1] Additional studies have shown destruction of alveolar bone, in correlation to nicotine

products, creating significantly deeper periodontal probe depths that harbor and host periodontal disease-causing pathogens such as *Staphylococcus, Streptococcus*, Aggregatibacter and Actinomyces are noted, along with increased furcation involvement.[1] The effect nicotine has on cytokine levels can also be a contributing factor to the progression of periodontal disease.[1] To further elaborate, additional studies have also discussed the risk of early onset periodontal disease among our youth population to be related to tobacco and nicotine use, such as combustible cigarettes, smokeless tobacco (snuff), cannabis, e-cigarettes and now ONPs, however, more research is indicated. While oral nicotine pouches (ONPs) carry a lower risk, their use can lead to dual dependency, elevating susceptibility among vulnerable youth populations.[20]

Staining

Limited data concluded, with minimal evidence that smokeless tobacco, produced more staining than nicotine pouches, and both deemed to cause far less staining in comparison to traditional cigarette smoke.[28] Studies concluded that e-liquid flavors and dyes could stain hard tissue, if used as a dual source with ONPs. Concentrations of the nicotine and exposure time are also factors that affect the distribution and severity of staining. More studies are still needed to support or refute this relationship.[28]

Gastrointestinal (GI)

Recent studies reviewing the impact of ingesting nicotine can negatively impact the gastrointestinal (GI) system. Swallowing ONP's pose serious health risks. If nicotine is swallowed the production of stomach acid is increased, which can stimulate heartburn and create ulcers, in conjunction with stress and an unhealthy diet.[29] Additional symptoms that can develop consist of an upset stomach, inflamed gut, nauseated discomfort due to the disruption of gut motility, abdominal pain, vomiting, loss of appetite, malaise, fever or chills, and possible headaches. In reference to gut motility, interference with regular movement of food passing through the digestive tract could lead to diarrhea or the opposite constipation.[29]

Lack of cognitive development in the adolescent brain increasing the addictive effects influence unfavorable impacts on the gastrointestinal (GI) system.[13,14] The level of severity of the GI symptoms are affected by the frequent usage of nicotine. ONPs in conjunction with E-cigarette usage heighten the increase of potential GI symptoms from risk of swallowing. Prevention and education are key factors to help combat these concerns, as evidence has linked gastrointestinal (GI) complications in adolescents, further research is needed to evaluate its long-term effects on gut health.[29]

Cancer Risk

Limited data suggests that ONPs are associated with a lower risk of cancer compared to conventional cigarettes. Nicotine itself is not a direct carcinogen.[5] Clinical trials found roughly 186 different chemical components were found in the composition of ONPs besides nicotine. At least eight were deemed hazardous. Methyl, eugenol, benzophenone and B-mycrene which are classified as carcinogenic agents to human beings, per to the International Agency for Research on Cancer. Tobacco-specific nitrosamines (TSNAs), which are potent carcinogens were found and presented at lower levels than traditional cigarettes or snus. However, high levels of formaldehyde were persistently detected in ONPs.[30] Previously discussed, keratinized tissues could possibly lead to oral squamous cell carcinoma, in reference to mucosal lesions that do not resolve when linked to risk factors such as nicotine and tobacco.[24]

The Oral Health Care Professional Role

A detailed health history is considered a vital tool in the assessment process, providing general medical and dental health patient information. Health history forms are used to gather clues to begin the process of creating a treatment plan, that is geared towards the needs of the patient prior to the initiation of treatment.[31] It is important to list all forms of tobacco that an individual may use on the health history form, smoking cigarettes, smokeless tobacco, and cannabis usage are not enough, with these new current tobacco and nicotine trends among the young adults. E-cigarettes and oral nicotine pouches usage must now be listed as an option for the patient to check off, to consider all future long-term effects with oral and systemic health.[20] This will

allow the clinicians and doctors to be able to direct the appointment accordingly with clinical exam findings, construction of treatment plans, elevate and shed light with prognosis for success with treatment plans or procedures and, lastly patient education to help the patient with their oral health outside of the routine visits.

ONPs should also be listed on consent forms prior to oral surgery and post operative care. Nicotine constricts blood vessels, reducing blood flow and oxygen supply to tissues, which can delay wound healing, viability of surgical flaps and increase the risk of infection. Nicotine can stimulate bone resorption, leading to bone loss and impaired bone healing. Additionally, nicotine is a considered a vasoconstrictor, that leads to hypoxia of tissues, which can raise pulse and blood pressure rates, affecting the cardiovascular system.[32]

It is the role of the oral health care provider to be knowledgeable of current trends, while providing routine care. Oral health care providers have an ethical obligation and duty to offer and facilitate tobacco and nicotine cessation treatments for their patients as a standard component of care. Having the appropriate screening questions on the healthy history form may allow an individual to inform their provider that they are using these products, without stating it verbally, which some patients struggle or feel uncomfortable with, especially shy young adults.

In addition, these screening questions may initiate crucial conversation between youth and guardians, creating parental involvement. It allows the clinician to freely bring it up and then supply the patient with the current information they need in a professional interaction. Putting the 5A's of tobacco/nicotine cessation in motion, with educational pamphlets on tobacco and nicotine cessation, caries, periodontal disease, and risks for oral cancer, can all be distributed to the patient at this time. Clinicians can also give parents and guardians resources to assist communication regarding the harm tobacco and nicotine products have on the overall health and oral health with their children.[33] Along, with educational resources, the oral health provider can refer the patient to appropriate local cessation programs, mental health providers and the patients primary care physician. Dental professionals should create a referral system to collaborate with the patient's health care providers to address both the physical and behavioral aspects of nicotine addiction.

Conclusion

Oral nicotine pouches may appear less harmful than comparable nicotine containing products. However, they are still relatively new with limited research on their long-term effects that is not collected from industry-founded studies. Social media, advertising and marketing trends that promote ONPs as a safer alternative, misleading younger adults to develop dual nicotine dependency, in conjunction with e-cigarettes. Updated health history and surgical consent forms should be implemented, to allow a gateway for dental and medical professionals to navigate proper treatment plans, clinical procedures and patient education. Awareness of the potential concerns and risk factors with oral health needs to be addressed, as these trends are currently so prevalent. Parental or guardian involvement, along with the oral healthcare providers, working together as team, have a better chance of our young adults being receptive to the possibilities of future harm, contributing to oral health and disease from usage from oral nicotine pouches. Supplemental pamphlets and resources to help and guide patients should be available and given to the patient regarding nicotine dependence and oral health. Oral health professionals can collaborate with public health workers, pediatricians, educators, and smoking cessation specialists to create educational programs aimed at preventing the use of nicotine pouches and other products among adolescents. Oral health professionals have an ethical obligation to inform patients on current trends that greatly impact the overall oral health of young adults.[34]

Table 2. Oral Nicotine Pouches Advantages and Disadvantages

(ONP) Oral Nicotine Pouch	Advantages	Disadvantages
Nicotine Replacement Therapy	• Comparable to lozenges with nicotine delivery • Higher nicotine delivery than nicotine gum • Less risk for caries • Less risk of cancer • Oral lesions heal faster	• Used for longer periods of time, ultimately leading to other tobacco dependency • Additional studies are needed in all areas before recommending this to patients, still new
Dental Caries	• Artificial Sweeteners halt in *S. Mutan* development and production- further research and evidence is ongoing to review this claim.	• If used in conjunction with E-cigarettes, the risk of caries increases. • Patient caries risk assessment is different in all patients • Need additional research
Oral Mucosa	• Lesions can heal quicker • Not as severe or combustible as tobacco	• Increased lesions with irregularities at the site of application • Irritation is common • Risk of Mechanical injury • Toxic chemicals penetrating soft tissues • Gingival blisters, ulcers • Jaw soreness/discomfort • Xerostomia • Need additional research on all topics and pathology
Periodontal Conditions/Bone loss and furcation involvement	• Not as severe or combustible as tobacco	• Toxicity in extracts affect cell attachment loss, and localized recession, Inflammatory responses ignited • Compromised tissue, destruction of alveolar bone • Provide a host for periodontal pathogens to harbor • Cytokine levels disrupted • Increased furcation involvement
Stain	• Less stain than traditional smoking cigarettes	• Risk increases with dual use with E-cigarettes
Cancer	• Nicotine is non-carcinogenic	• ONP's have other toxins that make them considered carcinogenic/harmful • More research is needed

Course Test Preview

To receive Continuing Education credit for this course, you must complete the online test. Please go to: *www.dentalcare.com/en-us/ce-courses/ce693/start-test*

1. Which of the following does NOT describe an Oral Nicotine Pouch?

A. Available in a multitude of flavors, within several brands.
B. Discrete, dissolvable, prefilled pouches with permeable properties.
C. 80-90% water, cellulose, along with crystalized nicotine powder or plant-based fibers.
D. Can be (TDN) tobacco-derived or (SyN) chemically synthesized.
E. Available in only one size for purchase.

2. Which of the following does NOT describe the role of oral health professionals in addressing the use of ONPs?

A. Listing ONP's on the health history form, which is a vital assessment tool providing appropriate screening questions as a standard component of patient care.
B. Be knowledgeable of current trends, while providing patient care instruction.
C. Educating patients about the risks and providing cessation support, by putting the 5A's in motion.
D. Clinicians can provide parents and guardians with resources to assist communication regarding the risk nicotine has on oral and overall health risk with their children.
E. Oral health care professionals do not have a role in addressing the use of ONPs with their patients.

3. What is the average range of nicotine per pouch in ONPs?

A. 0.5-2 mg
B. 1.29-6.11 mg
C. 2-8 mg
D. 5-10 mg

4. Which of the following statements is true regarding the cancer risk associated with oral nicotine pouches (ONPs)?

A. Nicotine itself is considered non-carcinogenic.
B. Clinical trials indicated that ONPs contain no hazardous chemical components.
C. Tobacco-specific nitrosamines (TSNAs) in ONPs are found at higher levels than in traditional cigarettes.
D. High levels of formaldehyde are not detected in ONPs.

5. What is the required age to purchase oral nicotine pouches?

A. 16 years
B. 18 years
C. 21 years
D. 25 years

6. Which of the following is NOT a potential gastrointestinal (GI) effect of using ONPs if accidently swallowed?

A. Increased production of stomach acid.
B. Loss of appetite and abdominal pain.
C. Reduced risk of ulcers and heartburn.
D. Inflammation causing disruption of gut motility.
E. Inference with regular movement of food passing through the digestive tract.

7. Which of the following is NOT an example of a healthcare outlet where oral health care providers would refer patients to help with nicotine addiction?

A. Local appropriate cessation programs
B. Mental health providers
C. Patients primary care physician
D. Social media influencer promoting ONPs, as a safer alternative to smoking.

8. (ONPs) Oral Nicotine Pouches were introduced to the United States in what year?

A. 2014
B. 2018
C. 2016
D. 2013

9. Which of the following is true, regarding the impact of nicotine on adolescent brain development?

A. It has no impact on brain development.
B. It can stimulate a gateway for potential addiction habits.
C. It improves cognitive performance.
D. It reduces the risk of psychiatric disorders.

10. Which of the following statements is incorrect regarding nicotine pouches and the oral mucosa?

A. Oral mucosal lesions can occur on the placement site but are mostly found directly at the sulcus site.
B. Hyperkeratotic tissue can be present, which can lead to oral squamous cell carcinoma.
C. Lesions can be more severe and resolve at a faster pace than smoking lesions due to combustible properties and change of site location.
D. Direct contact on gingival tissues can initiate irritation and lead to mechanical injury.

11. Which of the following statements is incorrect regarding nicotine pouches and periodontal disease?

A. Extracts in oral nicotine pouches have effects on gingival attachment loss and gingival recession.
B. Microenvironment disruption can raise the inflammatory response, creating periodontal involvement in oral tissue.
C. Activation of nicotinic acetylcholine receptors (nAChR) does not suppress the periodontal ligament (PDL) fibroblast cells, or integrity of stem cells.
D. Destruction of alveolar bone from nicotine products can increase periodontal pocket depths to harbor and host pathogens, such as Staphylococcus, Streptococcus, Aggregatibacter, and Actinomyces.

12. Which of the following statements is true regarding FDA regulations on oral nicotine pouches (ONPs)?

A. The FDA has approved ONPs as a method for smoking cessation.
B. The Tobacco Control Act does not apply to synthetic nicotine.
C. The FDA requires all flavored tobacco products to undergo a detailed science-based review.
D. There are no age verification requirements for purchasing ONPs.

13. Which of the following statements is true regarding the impact of oral nicotine pouches (ONPs) on dental caries?

A. Cambra is an assessment tool that should be used to assess the patient's risk for dental caries with usage of ONPs.
B. ONPs have no impact on dental caries risk.
C. Artificial sweeteners in ONPs have the potential to reduce the risk of dental caries and further research is not indicated on these claims.
D. ONPs are more harmful than e-cigarettes in terms of dental caries risk.

14. Which of the following statements is true regarding the staining effects of oral nicotine pouches (ONPs)?

A. ONPs produce more staining than smokeless tobacco (snus).
B. ONPs cause far less stain compared to traditional cigarette smoke.
C. E-liquid flavors and dyes have no impact on staining when used with ONPs.
D. Exposure time is not a factor in the production of stain.

15. Which of the following statements is true regarding oral nicotine pouches (ONPs) as a nicotine replacement therapy (NRT)?

A. The FDA has approved ONPs as a method for smoking cessation.
B. ONPs have been proven to be more effective than nicotine gum.
C. There is limited current literature and research available to classify ONPs as NRT.
D. ONPs are less addictive than other nicotine replacement therapies.

References

1. Ye D, Rahman I. Emerging Oral Nicotine Products and Periodontal Diseases. Int J Dent. 2023 Feb 10;2023:9437475. doi: 10.1155/2023/9437475.
2. Adams, A & Lamphere, A. Electronic Cigarette use among youth and adolescent. Dimensions of Dental Hygiene. June/July 2024; 22(4):42-45.
3. Powder, S. What we know and don't know about nicotine pouches. Hopkins bloomberg public health. April 24, 2024. Accessed April 1st, 2025.
4. Patel M, Kierstead EC, Kreslake J, Schillo BA. Patterns of oral nicotine pouch use among U.S. adolescents and young adults. Prev Med Rep. 2023 May 12;34:102239. doi:10.1016/j.pmedr.2023.102239.
5. M Jackson J, Weke A, Holliday R. Nicotine pouches: a review for the dental team. Br Dent J. 2023 Oct;235(8):643-646. doi: 10.1038/s41415-023-6383-7. Epub 2023 Oct 27.
6. Rossel, S. Nicotine pouches under attack in Europe. Tobacco asia. March 18th, 2025. Accessed April 1st 2025.
7. Mallock-Ohnesorg N, Rabenstein A, Stoll Y, Gertzen M, Rieder B, Malke S, Burgmann N, Laux P, Pieper E, Schulz T, Franzen K, Luch A, Rüther T. Small pouches, but high nicotine doses-nicotine delivery and acute effects after use of tobacco-free nicotine pouches. Front Pharmacol. 2024 May 22;15:1392027. doi: 10.3389/fphar.2024.1392027.
8. Muse. (2025). How man nicotine pouches are equivalent to a pack of cigarettes? October 29th, 2024. Accessed April 1st, 2025.
9. Northerner. (2024) All nicotine brand pouches. Accessed April 1st, 2025.
10. U.S Food & Drug Administration. (2024). Family smoking prevention and tobacco control act-An Overview. U.S Food & Drug Administration. Accessed April 1st, 2025.
11. Li D, Ossip DJ, Bansal-Travers M, Xie Z. Impact of the FDA flavour enforcement policy on flavoured electronic cigarette use behaviour changes. Tob Control. 2022 Nov;31(Suppl 3):s176-s183. doi: 10.1136/tc-2022-057492.
12. CDC (2024) Smoking and tobacco use. January 31st, 2025. Accessed April 1st, 2025.
13. Goriounova NA, Mansvelder HD. Short- and long-term consequences of nicotine exposure during adolescence for prefrontal cortex neuronal network function. Cold Spring Harb Perspect Med. 2012 Dec 1;2(12):a012120. doi: 10.1101/cshperspect.a012120.
14. Yuan M, Cross SJ, Loughlin SE, Leslie FM. Nicotine and the adolescent brain. J Physiol. 2015 Aug 15;593(16):3397-412. doi: 10.1113/JP270492. Epub 2015 Jun 23.
15. Truth Initiative: Freedom from nicotine addiction. (2021, September,19). Colliding crises: Youth mental health and nicotine use. Truth Initiative: Freedom from nicotine addiction. Accessed April 1st, 2025.
16. Tosakoon S, Romm KF, Berg CJ. Nicotine pouch awareness, use and perceptions among young adults from six metropolitan statistical areas in the United States. Tob Prev Cessat. 2023 Jun 7;9:19. doi: 10.18332/tpc/163243.
17. Phan L, Zarei K, Chen-Sankey J, Hacker K, Ajith A, Jewett B, Choi K. Exposure to nicotine pouch marketing and nicotine pouch experimentation among U.S. adults who use commercial tobacco. Prev Med Rep. 2024 Aug 23;46:102868. doi: 10.1016/j.pmedr.2024.102868.
18. John Hopkins Bloomberg school of public health. (2025). "Discreet" and "Convenient". How oral nicotine pouch ads appeal to the youth market. April 3rd, 2025. Accessed April 3rd, 2025.
19. Sparrock LS, Phan L, Chen-Sankey J, Hacker K, Ajith A, Jewett B, Choi K. Nicotine Pouch: Awareness, Beliefs, Use, and Susceptibility among Current Tobacco Users in the United States, 2021. Int J Environ Res Public Health. 2023 Jan 22;20(3):2050. doi: 10.3390/ijerph20032050.
20. Chaffee BW, Couch ET, Vora MV, Holliday RS. Oral and periodontal implications of tobacco and nicotine products. Periodontol 2000. 2021 Oct;87(1):241-253. doi: 10.1111/prd.12395.
21. Saylor-Boles, C.D. & Sutton, J.D. Stun out the tobacco habit. Dimensions of Dental Hygiene. November 2014;12(11):60–62,65. Accessed April 1st, 2025.

22. Gupta M. Sugar Substitutes: Mechanism, Availability, Current Use and Safety Concerns-An Update. Open Access Maced J Med Sci. 2018 Oct 19;6(10):1888-1894. doi:10.3889/oamjms.2018.336.
23. Gaur S, Agnihotri R. The Role of Electronic Cigarettes in Dental Caries: A Scoping Review. Scientifica (Cairo). 2023 Aug 30;2023:9980011. doi: 10.1155/2023/9980011.
24. Biorn, C. Caries Risk of E-cigarette use. Dimensions of Dental Hygiene. December 2020;18(11):36-39. Accessed April 1st, 2025.
25. Keogh, A. Nicotine pouches. Br Dent J 230, 61–62 (2021). https://doi.org/10.1038/s41415-021-2622-y.
26. Rungraungrayabkul D, Gaewkhiew P, Vichayanrat T, Shrestha B, Buajeeb W. What is the impact of nicotine pouches on oral health: a systematic review. BMC Oral Health. 2024 Aug 3;24(1):889. doi: 10.1186/s12903-024-04598-8.
27. Alizadehgharib S, Lehrkinder A, Alshabeeb A, Östberg AK, Lingström P. The effect of a non-tobacco-based nicotine pouch on mucosal lesions caused by Swedish smokeless tobacco (snus). Eur J Oral Sci. 2022 Aug;130(4):e12885. doi: 10.1111/eos.12885. Epub 2022 Jul 19.
28. Karanjkar RR, Preshaw PM, Ellis JS, Holliday R. Effect of tobacco and nicotine in causing staining of dental hard tissues and dental materials: A systematic review and meta-analysis. Clin Exp Dent Res. 2023 Feb;9(1):150-164. doi: 10.1002/cre2.683. Epub 2022 Nov 13.
29. Case KR, Clendennen SL, Tsevat J, Harrell MB. Risk of respiratory, gastrointestinal, and constitutional health symptoms: A cross-sectional study of Texas adolescent and young adult nicotine and marijuana vapers. Prev Med. 2022 Jun;159:107057. doi:10.1016/j.ypmed.2022.107057. Epub 2022 Apr 20.
30. Travis N, Warner KE, Goniewicz ML, et al. The Potential Impact of Oral Nicotine Pouches on Public Health: A Scoping Review. Nicotine Tob Res. 2025;27(4):598-610. doi:10.1093/ntr/ntae131.
31. American Dental Association. (2024). Medical/Dental health history. Accessed April 1st, 2025.
32. Omar Ashour, Leen Al-Huneidy, Hilali Noordeen,The implications of vaping on surgical wound healing: A systematic review, Surgery 2023 173 (6): 1452-1462. doi:10.1016/j.surg.2023.02.017
33. American Cancer Society. (2024). Keeping your kids tobacco-free. Accessed April 1st, 2025.
34. Rusiecka AW, Szymacha K, Lewkowicz N. The safety of using oral nicotine pouche – consideration of their effects on general health, oral mucosa and periodontal diseases, comparing them to snus and other nicotine containing products. J Pre Clin Res. 2024. doi:10.26444/jpccr/189645.

Additional Resources

- No Additional Resources Available

About the Authors

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Katie L. Pondolfino RDH, BSDH, MAAL is an adjunct professor at Empire State University, where she teaches community health, leadership in healthcare and health-care ethics. She is also an adjunct professor at the University of Bridgeport in Connecticut where she teaches dental practice management. Katie is also an adjunct classroom teacher and dental hygiene clinical instructor at SUNY Broome Community college, where she advises, teaches and assists with all student levels within the dental hygiene program. With 18 years of clinical dental hygiene experience, and in-depth experience as a previous dental coordinator at the Greater Binghamton Health Center, a public health hospital. Pondolfino has practiced in general dental offices and specialty settings, such as public health pediatric, and periodontal practices. Katie is also published with several Honorarium's with RDH, an influential international dental hygiene magazine.

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